

ONR

GRANT NO: N00014-90-J-3070

Title: Characterization of Ground Squirrel Retinal Ganglion Cells

PROGRESS REPORT (Covers period 7-1-90 to 12-31-90)

PERSONNEL:

Period of Service

<u>Name</u>	<u>Title</u>	<u>From</u>	<u>To</u>	<u>% Effort</u>
N. Lugo-García, Ph.D.	P.I.	7-1-89	12-31-90	25
R. E. Blanco, Ph.D.	Co-I.	7-1-89	12-31-90	20
Ivonne Santiago	Technician	5-1-90	12-31-90	100

Our work during this period mainly involved setting up new electrophysiological equipment for intra-cellular injections of retinal ganglion cells and performing immunohistochemical studies on the ground squirrel retina.

We completed experiments relating to the nature of neurotransmitters/modulators in this retina, with particular interest in the ganglion cell layer. We investigated 1) the distribution of GABAergic neurons using antibodies against GABA and GAD and 2) the distribution of catecholamines using an antibody against tyrosine hydroxylase (TH). Retinal sections and wholemounts were incubated with the particular antibody and then processed using immunofluorescence and/or the avidin-biotin method.

1) Our studies of the distribution of GAD-like and GABA-like immunoreactivity revealed labeling in the inner nuclear layer (INL), inner plexiform layer (IPL) and ganglion cell layer (GCL). Labeling in the IPL was concentrated in 5 bands. Based on their location, soma size, and distribution of their labeled processes, immunoreactive cells in the INL were identified as amacrine cells. In the GCL a heterogeneous population of neurons exhibited GAD- and GABA-like immunoreactivity. We assumed they might be of two types: displaced amacrine cells and ganglion cells. To determine if some of the immunoreactive cells in the GCL were ganglion cells, double labeling experiments were performed using rhodamine latex microspheres (beads) as a retrograde neuronal tracer. These experiments revealed a very small number of GAD-positive, medium sized ganglion cells. This work was submitted for publication to Visual Neuroscience.¹

2) After incubating retinal sections and wholemounts with the antibody against TH, the only immunoreactive neurons present were amacrine cells and displaced amacrine cells. We studied the morphology, location, soma size distribution and distance to the nearest neighbor of these TH-amacrine cells. These results will be presented at the annual meeting of the American Association of Anatomists on April, 1991.²

1. Lugo-García, N., Blanco, R.E., Hughes, T.E., and Karten, H.J.: GAD- and GABA-positive cells in ground squirrel retina, including GAD-positive ganglion cells. Visual Neuroscience (1990, submitted).

2. Lugo-García, N. and Blanco, R. E.: Amacrine cells immunoreactive to tyrosine hydroxylase in the ground squirrel retina. Anatomical Record (1990, submitted)

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